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Risk Reduction and Environmental Stewardship—Remediation Services

Desk Instruction

for # Quality Assurance Checklist for Preparation of Data Sets from the RRES-RS Project Technical Database

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Quality Assurance Checklist for Preparation of Data Sets from the ER Project Technical Database

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List of Acronyms and Abbreviations

DBA	database administrator
DI	Desk Instruction
EDD	electronic data deliverable
ERDB	environmental restoration database
FD	frequency of detect
LANL	Los Alamos National Laboratory
QC	quality control
RPF	Records Processing Facility
RRES-RS	Risk Reduction And Environmental Stewardship—Remediation Services
SMO	Sample Management Office

Quality Assurance Checklist for Preparation of Data Sets from the RRES-RS Project Technical Database

1.0 PURPOSE

This Desk Instruction (DI) states the responsibilities and describes the process of performing quality-assurance checks with regard to the preparation of data sets retrieved from the environmental restoration database (ERDB).

1.1 The RRES-RS Project data stewards in the Environmental Information and Technology Team have the primary responsibility for performing the quality assurance checks.

1.2 Electronic data sets that are prepared from the ERDB undergo standard quality assurance checks before they are available for reporting external to the RRES-RS Project.

1.3 Quality assurance checks are performed for both field-specific information (i.e., field data) and for analytical data (see Sections 2.2 and 2.9) to ensure the completeness, accuracy, and correctness of a data set.

1.3.1 Completeness means that all locations and samples associated with a site, as well as all the analytical data, were retrieved from the ERDB.

1.3.2 Accuracy means that the entries in the database are in agreement with available hardcopy records for both analytical and field data.

1.3.3 Correctness means that the data were reviewed to identify quality problems that impact the usability of the data for its intended purpose. For example, data sets prepared for site risk screening purposes should not include data for field screening, waste characterization, or quality control samples.

All electronic data sets prepared by a data steward must undergo internal review by at least one other data steward before delivery. (The technical teams may perform additional quality-assurance checks in the process of preparing a report.)

2.0 SCOPE

2.1 This DI describes the quality assurance checks that are performed by the Data Stewards in preparing a data set from the ERDB.

2.2 Subcontractors performing this work under the RRES-RS project's quality program shall follow this DI.

2.3 Members of the RRES-RS Project Environmental Information and Technology Team perform the following quality assurance checks on

analytical and field data before the data stewards retrieve the electronic data from the ERDB.

2.3.1 All analytical data received since April 1995 undergo routine validation by qualified data validators (see SOPs –15.1 through 15.7). (The results of routine validation are data quality flags and explanatory reason codes that are associated with an individual analytical result.)

2.3.2 Data validators input to the ERDB the data quality flags and reason codes using the Verification and Validation (V&V) module of the SMO Application.

2.3.3 Data verifiers check the electronic data deliverables (EDD) against the hardcopy analytical data package, if errors are found, the EDD is rejected and the laboratory is requested to send a corrected EDD.

2.3.4 Data Specialists perform quality assurance checks on field data per DI-4.26, Review of Sample Field Data.

Note: The type of sample information that the ER Project retains in the ERDB and the quality assurance processes that the data are subjected to, have changed and improved over time since the ERDB was initiated in 1990. Therefore, some types of information may be absent or incomplete for older samples, or may be inaccurate because stringent quality assurance processes were not in place in earlier years.

2.4 The data steward performs quality assurance checks on the AllAnalyses table for the field data and the analytical data to prepare the electronic data set for screening assessment calculations.

Note: Certain fields in the electronic data set must be complete and accurate so the custom software that performs the screening assessment calculations will execute successfully. The data calculations and some of the quality assurance checks were automated using custom tools in the Access Tool Box.

2.5 The data steward reviews, as an important quality assurance check, data summaries in the Frequency of Detect (FD) tables to identify potential data quality issues that are included in this Desk Instruction. (The output of the screening assessment calculations includes the FD tables for each RFI class [e.g., inorganic, radionuclide, and organic].)

Note: Data are never deleted from the data set; rather, the data steward uses queries to remove unwanted records from the AllAnalyses table and places them in new tables in the Access database.

3.0 TRAINING

3.1 Data Stewards shall train to and use the current version of this DI; contact the author if the DI text is unclear.

3.2 Data Stewards shall train to this DI with a Data Steward that has previously been performing this activity.

3.3 The responsible Team Leader (TL) shall ensure that the appropriate personnel complete all applicable training assignments.

4.0 DEFINITIONS

4.1 *A3* — Acronym for "Analysis and Assessment," the RRES-RS Sub-Team responsible for the activities in this Desk Instruction. A3 is part of the Environmental Information and Technology Team.

4.2 *Analytical data* — Analytical data refers to the results that are reported by the analytical laboratories that the Project uses for chemical and/or physical analysis of samples.

4.3 *Authorizing individual* — An appropriate Project Management Team (PMT) member, Project Leader, Team Leader, or other authorized individual who has the authority to delegate data pulls from the ERDB.

4.4 *DBA* – Database Administrator.

4.5 *Data Steward* — A member of the "Analysis and Assessments" Sub-Team who is trained to this DI and is responsible for performing the tasks described in this DI.

4.6 *Data Validator* — An RRES-RS Project chemist trained to evaluate analytical chemistry data as per SOPs 15.01-15.07.

4.7 *EDD* – Electronic Data Deliverable is the electronic copy of the data package that is received from the laboratory and uploaded to the ERDB.

4.8 *ERDB* — Acronym for RRES-RS (formerly ER) Project database.

4.9 *Field-specific information* — Field-specific information, or field data, refers to data about the sampling location, as well as information about the sample itself, such as matrix, depth, and date of collection.

4.10 *Frequency of Detect (FD) table* — A data table that summarizes the analytical data for a group of samples, including the comparison of the analytical data with LANL-specific background values (for inorganics and radionuclides) or detected chemicals (for organics).

4.11 *LOCATION_ID* — The unique identifier corresponding to a specific location, usually further defined by state plane coordinates (x, y, and z coordinates).

4.12 *PRS* — Potential Release Site, a spatial and/or regulatory definition for a potentially contaminated area.

4.13 *Requesting individual* — An appropriate Project Management Team (PMT) member, field team leader, risk assessor, or other authorized individual who demonstrates a specific need to evaluate a particular data set from the ER Project technical database.

4.14 *RFI* — RCRA Facility Investigation

4.15 *RFI_Class* — The classes of chemical constituent, including organic, inorganic, and radionuclide.

4.16 *RFI Report* — RCRA Facility Investigation report; a standard RRES-RS Project deliverable that adheres to the RFI Annotated Outline found online at: http://erinternal.lanl.gov/home_linkd/Library_doctemp.htm.

4.17 *Sample Collection Log (SCL)* — A form that is completed by the field team at the time that a sample is collected (see SOP-1.04). The SCL contains information about the sample, such as matrix, depth, and date of collection.

4.18 *Sample_ID* — The unique identifier corresponding to a particular sample.

4.19 *Samples Taken Table* — A table that lists the locations, samples, request numbers, and analytical suites associated with a PRS or group of PRSs.

4.20 *TCLP* — Toxicity Characteristic Leaching Procedure.

5.0 RESPONSIBLE PERSONNEL

The following personnel are responsible for activities identified in this procedure:

- Data Steward or user
- Data Validator
- PL, TL, or requesting individual

6.0 BACKGROUND AND PRECAUTIONS

The RRES-RS Project will not permit non-Project personnel access to electronic data or information with a network or on-line connection to the ERDB unless an exceptional circumstance or need exists. Access to ER Project electronically-stored data in the ERDB by non-Project personnel is addressed in the ER Project Directive 99-PD-02 (E/ER:99-323), dated 02 November 1999, which is available on the RRES-RS Project world wide web homepage at http://erinternal.lanl.gov/documents/Procedures/pds.htm.

7.0 EQUIPMENT

Computer and data steward role assignment which allows access to the ERDB.

8.0 PROCEDURE

8.1 The data steward queries the ERDB to determine the Field QC status of the samples requested.

Note: If all samples do not have a Field QC status code of "DI426" (or the DI426 code variations), request that Field QA be completed per DI-4.26 prior to retrieving the data from the ERDB.

8.2 The data steward retrieves the electronic data from the ERDB, using the Access Tool Box (see Attachment A), to create a monolith table, referred to as the "AllAnalyses" table.

Note: This DI refers to checks that are performed for specific data fields that are in the AllAnalyses table. The quality assurance checks are performed using Microsoft Access to query the values contained in specific data fields.

8.3 Quality Assurance Checks for Field Data

The sample information that the RRES-RS Project collects in the field is subject to change over time. For example, some sites were excavated or otherwise remediated. This has led to changes in the database, such as the inclusion of an "excavated" flag that did not exist when the sample was first analyzed. Thus, some types of information may not be present in the ERDB for older samples and must be assigned and evaluated at the time of assessment.

8.3.1 The data steward ensures that all the locations and samples associated with a particular potential release site (PRS) or other site (e.g., canyon reach or well) were identified. This evaluation is made using one or more of the following processes:

- Perform multiple queries against the database to retrieve data based on criteria for values in LOCATION_ID, SAMPLE_ID, TA, or PRS_ID; compare the results of the queries to check for inconsistencies.
- Review a map of the general area and evaluate locations at and/or near the site. (Note that many of the PRS boundaries in the Project spatial files are not updated to reflect sampling activities.)
- Communicate with the Project leader and/or technical team responsible for the site to obtain Location ID and/or Sample ID lists.

8.3.2 The data steward checks, at a minimum, the fields in the AllAnalyses table described in the table below.

Note: Accurate values are required for the data fields listed in the table below before the data set can undergo screening assessment calculations. Acceptable documentation for providing an update to field data includes field logbooks, sample collection logs, and, for missing or incomplete fields such as media code and/or excavation status, knowledgeable subject-area experts and maps. In addition, lookup tables of standardized values for certain fields are maintained in the ERDB.

Note: The AllAnalyses table may be reviewed for erroneous or missing field data by querying in the Access database for distinct combinations of PRS_ID, LOCATION_ID, SAMPLE_ID, SAMPLE_COMMENTS, and the fields listed below.

Field in AllAnalyses Table	Quality Assurance Operation
EXCAV_FLAG	Identify and remove from the AllAnalyses table records for samples excavated in a remedial action (EXCAV_FLAG=Y). (This field is dynamic in the database and may need verification by checking the hardcopy cleanup report.)
SAMPLE_USG_CODE	Identify and remove from the AllAnalyses table records for samples that were collected solely for the purpose of waste characterization, health and safety, field screening, or background characterization.
FIELD_PREP	For water samples, verify the field preparation of either filtered or nonfiltered by checking the Sample Collection Log.
BEGIN_DEPTH	For solid samples, the begin depth, if present, should be less than the end depth. If no depth is present, the reviewer must establish whether a valid depth is available for the sample. For liquid samples a depth may not be applicable, or the begin and end depths may be the same.
END_DEPTH	For solid samples the end depth, if present, should be greater than the begin depth. If no depth is present, the reviewer must establish whether a valid depth is available for the sample. For liquid samples a depth may not be applicable or the begin and end depths may be the same.
DEPTH_UNITS	Standardize the depth units to feet.
FLD_MATRIX_CODE	Review values for the field matrix code for agreement with the EVAL_CLASS and the analytical reporting units.
EVAL_CLASS	Review values for the sample evaluation class. If absent, assign the evaluation class in order to perform comparisons with background values.

Field in AllAnalyses Table	Quality Assurance Operation
FIELD_QC_TYPE_CODE	Use the Access custom tools to identify and remove from the AllAnalyses table records for certain field quality control samples as applicable to the specific data set and reporting requirements (e.g., blanks, rinsates, field spikes)

8.3.3 The data steward assigns the PRS_ID values in the AllAnalyses table, based on the data reporting requirements of the data requestor.

8.4 Quality Assurance Checks for Analytical Data

After the AllAnalyses table is created, the data steward conducts a completeness check on the data for the analytical tests originally ordered versus the analytical tests returned by the analytical laboratory and uploaded to the ERDB. Check Sample ID, Request Number, and Analtyical Method Ordered.

- The HISTORICAL_LAB_REQUEST_DETAIL table is used for samples generated prior to implementation of the SMO Application (February ’02).
- The LAB_REQUEST_DETAIL and SAMPLE_HDR tables are used for samples generated since implemenation of the SMO Application.

Note: The HISTORICAL_LAB_REQUEST_DETAIL only tracks analytical requests submitted since April 1995. If no analytical data are found for a sample collected before April 1995, the data steward works with the responsible Team Leader to determine what, if any, analytical data should be available for that sample.

8.4.1 The data steward conducts a completeness check on the Analyte Count per suite using the Request Number, Sample Id, Analytical Suite, and Analyte Code.

8.4.2 The data steward checks the values in the ANALYTE_CODE field to ensure that results for laboratory quality control samples are not misidentified as sample results. (A list of analyte names that are associated with quality control samples is included in Attachment A.)

Note: If analytes are missing, the data steward works with SMO Staff to have missing data located and uploaded to the ERDB. DO NOT CONTINUE, WAIT UNTIL ALL MISSING DATA IS UPLOADED AND RE-PULL DATA SET.

8.4.3 The data steward verifies holding times by comparing the collection dates, shipping dates, and analysis dates.

8.4.4 The data steward reviews the STD_SAMPLE_VALUE, STD_REPORTING_UNITS, and STD_UNCERTAINTY (for radionuclide results only) fields.

8.4.5 If Null values are found, the data steward performs the necessary unit conversion using the values found in SAMPLE_VALUE, REPORTING_UNITS, and UNCERTAINTY to populate the standardized fields in the AllAnalyses table, ensuring 1-sigma uncertainty values.

8.4.6 For pre-calculated or populated standard values, the data steward checks the conversions to ensure they were done properly. If problems are identified, work with the Database Administrator (DBA) to ensure the values are updated in the ERDB.

8.4.7 The data steward converts tritium results for soil and rock samples that have STD_REPORTING_UNITS = pCi/mL or pCi/L (or REPORTING_UNITS = pCi/mL or pCi/L if STD_REPORTING_UNITS is Null) to units of pCi/g (STD_REPORTING_UNITS = pCi/g). (The percent moisture value for the sample must be obtained, either by checking for an analytical result for percent moisture (ANALYTE_NAME = “Percent Moisture” or “Unbound Water”), or checking the PERCENT_MOISTURE field.)

Note: If the percent moisture value is not available, the conversion cannot be performed.

8.4.8 Ensure the Quant Limit and MDA fields are populated for organic, inorganic, and radionuclides.

8.4.9 The data steward uses the Access custom tools to check for mismatched values in MATRIX and REPORTING_UNITS; e.g., water samples reported with soil units of measurement;

Note: All fields are checked in the AllAnalysis table, mismatched values are resolved by checking the hardcopy records. Ensure the changes are provided to the DBA for update.

8.4.10 The results for Toxicity Characteristic Leaching Procedure (TCLP) analyses for soil samples are returned in units of mg/L. (Checking the values in the ANALYSIS_METHOD or SUITE_NAME fields may identify TCLP results.)

8.4.11 The data steward removes the screening-level analytical results produced by mobile laboratories from the AllAnalyses table and

moves them to a separate table in the Access database. (Checking values in the LAB_CODE field may identify mobile laboratory results.)

Note: The ER Project used mobile laboratories for screening samples in the mid-1990s. The mobile-laboratory data were uploaded to the ERDB in the same tables that contain fixed-laboratory results. The mobile laboratory results are not of the same pedigree as fixed-laboratory results because a different level of quality was applied to the analyses in exchange for a quicker turnaround on analytical results. The difference may have been in modifications to analytical methods or abbreviated quality control procedures. These differences mean that the mobile laboratory data cannot be compared directly with the fixed-lab data.

8.4.12 The **data steward** checks data sets for redundant or missing analytical records.

Note: Redundant records occur when multiple uploads of the same record occur. Missing records arise when the original upload was faulty or reporting by the analytical laboratory was erroneous.

The following is a table identifying possible reasons for redundant records. Some require review by a chemist for a decision as to which records should remain with the data set through data assessment and which records should be moved to another table. Some require review of the hard copy data package.

REASON	EXPLANATION
ORIGINAL AND DILUTION	WHEN A REDUNDANT RECORD IS CAUSED BY A DIFFERENT DILUTION ANALYSIS OF A SAMPLE.
RE-ANALYZED	WHEN A REDUNDANT RECORD IS CAUSED BY A DIFFERENT ANALYSIS_DATE.
TWO MATRICES LISTED	TWO MATRICES ARE LISTED IN THE LABORATORY DATA.
COMBINATION REDUNDANT RECORD	RECORD IS ALMOST A COMPLETE REDUNDANT RECORD, BUT SOME COMBINATION OF FIELDS ARE NOT CONSISTENT FROM ONE TO THE NEXT.
TWO VALUES	TWO RESULTS FOR SAME ANALYSIS, REST OF RECORD IS REDUNDANT.

REASON	EXPLANATION
TWO SOURCE FILES	WHEN A REDUNDANT RECORD IS CAUSED BY A DIFFERENT SOURCE FILE. REVIEW ALL SEQ_NUMs BECAUSE FILE NAMES CAN REPRESENT METHODS RUN.
RE-REPORTED @ LATER DATE	WHEN THE REDUNDANT RECORD IS CAUSED BY A DIFFERENT REF_DOC VALUE, MEANS IT WAS RE-REPORTED.
RE-LOADED @ LATER DATE	WHEN THE REDUNDANT RECORD IS CAUSED BY A DIFFERENT LOAD DATE, MEANS THE DATA WAS RE-LOADED.
TRUE REDUNDANT RECORD	WHEN A REDUNDANT RECORD IS CAUSED BY ONLY A DIFFERENT AHID OR SEQ_NUM. RETAIN THE LOWEST SEQ_NUM AND MOVE THE OTHER SEQ_NUMs OUT OF ALLANALYSES.
MULTIPLE CONTAINERS RUN	WHEN A REDUNDANT RECORD IS CAUSED BY A DIFFERENT LAB_SAMPLE_ID, CONTAINER_ID, OR COMMENT CONCERNING A CUT OR CONTAINER NUMBER.
TWO METHODS OR TECHNIQUES RUN	WHEN A REDUNDANT RECORD IS CAUSED BY A DIFFERENT ANALYSIS_METHOD OR TECHNIQUE_CODE.
ORIGINAL AND REVAL	WHEN A REDUNDANT RECORD IS CAUSED BY A RE-EVALUATION OF A SAMPLE.
METTAL AND METTCLP RUN	WHEN A REDUNDANT RECORD IS CAUSED BY A SAMPLE HAVING BOTH A STANDARD METAL ANALYSIS AND A TCLP ANALYSIS.

Note: A chemist should be contacted to identify the appropriate use of records that were diluted or reanalyzed. (The appropriate records are retained in the AllAnalyses table; inappropriate records are moved to a separate table in the Access database.)

8.4.13 The data steward uses queries to check the ANALYTICAL_SUITE field in the AllAnalyses table. (The ANALYTICAL_SUITE field is not derived from the ERDB; it is a calculated field that is populated by the Access Tool Box during download. The ANALYTICAL_SUITE field is required for assigning the focused validation qualifier.)

8.4.14 The data steward reviews and assigns, as necessary, a value to the RFI_CLASS field in the AllAnalyses table. (The RFI_CLASS field is obtained from the ERDB but may be incomplete.)

8.4.15 The data steward populates the RFI_QUAL and RFI_REASON fields in the AllAnalyses table from the LANL_VALIDATION table where the set type is "ROUTINE03" and the REPORTING_FLAG is "Y."

8.4.16 For records with unassigned qualifiers or qualifiers that must be updated, the data steward requests that a chemist review the data set and assign or update the qualifiers and reason codes and provide the information to the DBA for upload to the ERDB

8.4.17 The data steward removes records for rejected analytical results (RFI_QUAL = "R") from the AllAnalyses table and moves them to a separate table in the Access database.

8.4.18 For "NQ" qualifier and reason codes, the data steward nulls out the values.

8.4.19 The data steward uses the Access custom tools to remove gamma-emitting analytes from the AllAnalyses table that are not reliably measured by gamma spectroscopy, as described in Approach to Gamma Spectroscopy Data *Quality Evaluation* (LA-UR-00-1088, ER2000-0061, March 2000).

8.4.20 The data steward uses the Access custom tools to remove radionuclide results obtained by gamma spectroscopy from the AllAnalyses table if a result was also obtained using a more reliable method (usually alpha spectrometry); for example, Am-241 and U-235 are included in the ER Project gamma spectroscopy suite, but these analytes are often also analyzed by alpha spectrometry, which is more sensitive than gamma spectroscopy.

8.5 Quality Assurance Checks Using the Frequency of Detect Table

8.5.1 The data steward creates an FD table (see example in Attachment D) using the Access custom tools for each RFI class (inorganic, radionuclide, and organic) using the Access Tool Box.

Note: The FD table review requires a greater level of expertise and experience on the part of the data steward than the quality assurance checks described in the previous sections of this Desk Instruction.

8.5.2 The data steward reviews the “Analyte” column to check for missing analytes (e.g., fewer than 23 metals, or one of the three uranium isotopes absent).

8.5.3 The data steward reviews the “Number of Analyses”" column to check for missing analytical results; for example, one metal analyte may have fewer analytical results than all the other metals.

8.5.4 The data steward reviews the minimum and maximum values for detected and nondetected results for anomalous results (very low or very high values). (Anomalous results are subjected to additional focused validation checks that usually include verification with hardcopy records.)

9.0 LESSONS LEARNED

9.1 Before performing work described in this DI, Data Stewards should speak with other team members to determine if any problems have arisen in preparing data sets recently.

9.2 During work performance and/or after the completion of work activities, Data Stewards, as appropriate, shall identify, and document any lessons learned and post them on the A3 server for reference by the team.

10.0 RECORDS

No Records are generated by this DI.

11.0 REFERENCES

To implement properly this SOP, RRES-RS project participants should become familiar with the contents of the following documents located at http://erinternal.lanl.gov/home_links/Library_proc.shtml:

- RRES-RS, Quality Management Plan
- QP-2.2, Personnel Orientation and Training
- QP-5.7, Notebook Documentation for Environmental Restoration Technical Activities
- SOP-01.01, General Instructions for Field Investigations
- SOP-01.04, Sample Control and Field Documentation
- DI-4.26, Review of Sample Field Data

12.0 ATTACHMENTS

Attachment A: Quality Control Analytes, 2 pages

Attachment B: Example of Excel Output File in Frequency of Detect Format

Attachment C: Access Tool Box Download

Attachment D: Abbreviated Data Assessment Checklist for Al lAnalyses, 2 pages

Using a token card, click here to record "self-study" training to this procedure.

If you do not possess a token card or encounter problems, contact the RRES-ECR training specialist.

Attachment A: Quality Control Analytes

Analytical Class	Analytical Suite	Analytical Method	Analyte Type	Analyte(s)	Method Target Analytes?
Organic	Herbicides	SW-846 EPA Method 8151A	Surrogate	2,4-Dichlorophenylacetic acid (DCAA)	N
Organic	High Explosives	SW-846 EPA Method 8330	Surrogate	1,4-Dinitrobenzene	N
Organic	PCBs	SW-846 EPA Method 8081A	Surrogate	Decachlorobiphenyl (DCB) 2,4,5,6-Tetrachloro-m-xylene	N
Organic	Pesticides/PCBs	SW-846 EPA Method 8081A; SW-846 EPA Method 8082	Surrogate	Decachlorobiphenyl (DCB) 2,4,5,6-Tetrachloro-m-xylene	N
Organic	Pesticides	SW-846 EPA Method 8081A	Matrix Spike	Lindane Heptachlor Aldrin Dieldrin Endrin 4,4-DDT	Y
Organic	Semivolatile Organic Compounds	SW-846 EPA Method 8270C	Surrogate	Nitrobenzene-d5 2-Fluorobiphenyl p-Terphenyl-d14 Phenol-d6 2-Fluorophenol 2,4,6-Tribromophenol 2-Chlorophenol-d4 1,2-Dichlorobenzene-d4	N
Organic	Semivolatile Organic Compounds	SW-846 EPA Method 8270C	Internal Standard	1,4-Dichlorobenzene-d4 Naphthalene-d8 Acenaphthene-d10 Phenanthrene-d10 Chrysene-d12 Perylene-d12	N

Analytical Class	Analytical Suite	Analytical Method	Analyte Type	Analyte(s)	Method Target Analytes?
Organic	Semivolatile Organic Compounds	SW-846 EPA Method 8270C	Matrix Spike	Phenol 2-Chlorophenol 1,4-Dichlorobenzene N-Nitroso-di-n-propylamine 1,2,4-Trichlorobenzene 4-Chloro-3-methylphenol Acenaphthene 4-Nitrophenol 2,4-Dinitrotoluene Pentachlorophenol Pyrene	Y
Organic	Volatile Organic Compounds	SW-846 EPA Method 8260C	Surrogate	4-Bromofluorobenzene Dibromofluoromethane Toluene-d8 1,2-Dichloroethane-d4	N
Organic	Volatile Organic Compounds	SW-846 EPA Method 8260C	Internal Standard	Fluorobenzene, Chlorobenzene-d5 1,4-Dichlorobenzene-d4 Bromochloromethane 1,4-Difluorobenzene	N
Organic	Volatile Organic Compounds	SW-846 EPA Method 8260C	Matrix Spike Analyte	1,1-Dichloroethane Trichloroethene Benzene Toluene Chlorobenzene	Y
Radionuclides	Isotopic Uranium	Chemical Separation/Alpha Spectroscopy	Tracer	Uranium-232	N
Radionuclides	Isotopic Plutonium	Chemical Separation/Alpha Spectroscopy	Tracer	Plutonium-242	N
Radionuclides	Americium-241	Chemical Separation/Alpha Spectroscopy	Tracer	Americium-243	N

Attachment B: Example Excel Output File in Frequency of Detect Format (for Soils and Sediments)

Analyte	Media Code	Number of Analyses	Number of Detects	Minimum of Detects (mg/kg)	Mean of Detects (mg/kg)	Maximum of Detects (mg/kg)	Soil Background Value (mg/kg)	Frequency of Detects >Background Value
Aluminum	ALLH	46	46	1800	6300	97000	29200	1/46
Antimony	ALLH	46	2	13.6	14.7	15.8	0.83	2/46
Arsenic	ALLH	46	14	0.75	40	520	8.17	1/46
Barium	ALLH	46	41	40	90	200	295	0/46
Beryllium	ALLH	46	39	1.2	8.9	101	1.83	32/46
Cadmium	ALLH	46	2	1.1	1.15	1.2	0.4	2/46
Calcium	ALLH	46	46	530	2500	14000	6120	1/46
Chromium, total	ALLH	46	43	2.5	28	370	19.3	5/46
Cobalt	ALLH	46	4	5.4	6.0	6.4	8.64	0/46
Copper	ALLH	46	44	5.5	1000	7200	14.7	42/46
Iron	ALLH	46	46	2610	6850	14400	21500	0/46
Lead	ALLH	46	46	6.1	3070	132000	22.3	36/46
Magnesium	ALLH	46	46	371	926	3140	4610	0/46
Manganese	ALLH	46	46	64.6	195	604	671	0/46
Mercury	ALLH	46	2	0.11	0.14	0.17	0.1	2/46
Nickel	ALLH	46	10	9.2	39	188	15.4	4/46
Potassium	ALLH	46	46	260	630	1760	3460	0/46
Selenium	ALLH	46	1	0.63	0.63	0.63	1.52	0/46
Silver	ALLH	46	8	2.3	4.5	9.1	1	8/46
Sodium	ALLH	46	3	120	460	1130	915	1/46
Thallium	ALLH	46	0	—	—	—	0.73	0/46
Uranium	ALLH	46	42	2.6	1400	45000	1.82	42/46
Vanadium	ALLH	46	37	4.5	9.3	18.2	39.6	0/46
Zinc	ALLH	46	46	12.3	123	2860	48.8	17/46

Attachment C: Access Tool Box Download

- ❑ Create and name MS Access database.

Note: see the naming convention document for database file and folder conventions on A3 Server within A3 Documentation folder.

- ❑ Create a folder for your database.

Note: Must have a final sample list and ensure field QA has been conducted. Check with requestor if unsure or conduct queries to confirm final list and QC status.

- ❑ Import (assuming sample list is complete) spreadsheet into your database using Access import tools.
- ❑ Download Data using A3 Toolbox.

Note: Toolbox only works on the local drive.

- Select Tools> Addins> ERDB Downloads
- Identify table and sample _id field at prompt
- Press execute

Note: the download program is designed to create another database called “xxxxxxxx.ERDB.dbm”

Note: documentation for toolbox exists on the A3 server / A3 Documentation folder.

The Toolbox generates the following tables:

- AllAnalyses (main table)
- Sample Count
- Chemical Analysis Results
- Qualifiers (LANL AND FIMAD)
- Analyte Code Lut
- Request Master
- PRS INFO
- Sample Info

Note: From this point forward, the data assessments will be performed in the AllAnalyses Table.

Attachment D: Abbreviated Data Assessment Checklist for AllAnalyses

PART 1 (Required fields to be checked in AllAnalyses)

- ❑ Verify samples in AllAnalyses: AllAnalyses Record Count:
- ❑ Conduct completeness check on Sample Id, Req. Number, and Analytical Method ordered.
- ❑ Conduct completeness check on Sample Id, Req. Number, and Analytical Method returned.
- ❑ Conduct an analyte count per Analytical Suite, Request Number, and Sample Id.
- ❑ Check field data for completeness and correctness (as required verify location x and y coordinate in the Location Hdr. Table) See DI4.28 for a complete list of fields to review.
- ❑ Check RFI Class, Analyte Name, Analytical Suite and Method for correctness.
- ❑ Check Analyte Code and Name to identify laboratory control analytes (see DI4.28 Appendix B)
- ❑ Check Dates (collection vs. shipping vs. analysis) for correctness; Sample holding time.
- ❑ Check Laboratory Code, Name, and Request Number to identify vintage or suspect data types within data set such as CST, AN-95, VVM, etc, or CST Radvan/Chemvan, onsite, and offsite, etc.

PART 2 (Sample value, uncertainty, unit, and laboratory reporting limit check and conversion)

- ❑ Check lab-reporting units against standard reporting units.
- ❑ Check zero and null value; ensure Quant Limit and MDA is populated for organic, inorganic and rad.
- ❑ Verify both MDA and uncertainty values are populated for radionuclide; verify 1-sigma uncertainty value.
- ❑ Convert to standard sample value, uncertainty (rad), and unit.
- ❑ Check conversions to standard sample value, uncertainty (rad) and unit.
- ❑ Check percent moisture field is populated for tritium (soil) conversion to pCi/g.
- ❑ Check min and max concentration per each in analyte (generate FD table) to target potential problems in reporting data and/or anomalies for further hard copy verification.

PART 3 (Qualifier flag and reason code check)

- ❑ Populate FU4 and RFI REASON CODE field with “reporting” qualifier and reason code from LANL VALIDATION.
- ❑ Have chemist review or assign final qualifier and reason code.
- ❑ Null “NQ” qualifier and reason code.

PART 4 (MS ACCESS custom toolbox automated data assessment checker)

- ❑ As a suggestion, use the Toolbox as a final check on data set, to convert depths, and remove data types. Note, it is not recommended to use Toolbox to remove some of the specified data below.

PART 5 (Remove the following data types from AllAnalyses)

- ❑ Field Quality Control Samples (manual)
- ❑ RADVAN/CHEMVAN SCREENING DATA (manual)
- ❑ Gamma Not Evaluated (use Toolbox)
- ❑ TCLP (manual)
- ❑ Gamma Spec with Alpha Spec (use Toolbox)
- ❑ Samples with Revals (manual, chemist will need to analyze)

Attachment D: Abbreviated Data Assessment Checklist for AllAnalyses, continued

- ❑ Samples with Dilutions (use Toolbox, confirm with chemist)
- ❑ EXCAVATED SAMPLES (manual)
- ❑ RFI “OTHER” CLASS (manual)
- ❑ Other specified data types requested by data user (manual)
- ❑ REJECTED DATA (manual)
- ❑ Null NQ qualifier

PART 6 (Resolve duplicate records)

- ❑ Run a duplicate query to identify duplicate records and address each pair appropriately. There are various reasons to have a duplicate.

***** UPDATE ERDB WITH YOUR CHANGES*****